

WHAT IS CLAIMED IS:

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1. A magnetic sensor that senses an external magnetic field using a spin-filtered sensor current flowing through a non-magnetic layer.

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2. The magnetic sensor as claimed in claim 1, further comprising:

15 a pair of ferromagnetic bodies provided on the non-magnetic layer and positioned parallel to an axis of magnetization of each of the ferromagnetic bodies; and

20 a power source that uses the ferromagnetic bodies as electrodes to supply the sensor current.

25 3. The magnetic sensor as claimed in claim 1, wherein:

a ferromagnetic film is provided on the non-magnetic layer; and

30 an axis of magnetization of the ferromagnetic layer is formed either parallel to or opposite to a direction of electron spin of the sensor current.

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4. The magnetic sensor as claimed in claim

3, wherein the ferromagnetic layer is formed as a free layer constituting either an anisotropic magneto-resistive film or a giant magneto-resistive film.

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5. The magnetic sensor as claimed in claim 4, wherein the giant magneto-resistive film constitutes a spin-valve structure.

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6. The magnetic sensor as claimed in claim 4, wherein the non-magnetic layer is formed from a material selected from a group consisting of aluminum, copper, chromium, or an alloy of these metals.

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7. The magnetic sensor as claimed in claim 2, wherein:

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the non-magnetic layer is formed of a semiconductor material; and

the axis of magnetization of one of the pair of ferromagnetic bodies changes so as to detect an external magnetic field.

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8. The magnetic sensor as claimed in claim 7, wherein the semiconductor material is indium

aluminum arsenide.

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9. The magnetic sensor as claimed in claim 7, wherein the semiconductor material is indium gallium arsenide.

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10. The magnetic sensor as claimed in claim 1, wherein the ferromagnetic body is formed from a material selected from a group consisting of iron, cobalt, nickel, or an alloy of these metals.

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11. A device for magnetically recording and reproducing information to and from a recording medium, the magnetic head unit comprising a magnetic sensor that senses an external magnetic field using a spin-filtered sensor current flowing through a non-magnetic layer.